

# THE CONNECTICUT AGRICULTURAL EXPERIMENT STATION

FERTILITY OF YOUR SOIL MEASURED BY THE MORGAN METHOD. A PRODUCT OF RESEARCH AT THIS STATION

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DATE 04/18/2018 PAGE 1 of: 1		TEST RESULTS - see back of report for explanation		
LABORATORY NUMBER:	1537	1538	1539	
YOUR SAMPLE	1	2	3	
CROP TO BE GROWN	organic hops	organic hops	organic hops	
SOIL TEXTURE	Loam	Sandy Loam	Sandy Loam	
ORGANIC MATTER	Medium Low	Medium Low	Medium Low	
pH	5.7	6.0	6.0	
NITRATE NITROGEN	High (25 ppm)	Medium High (12 ppm)	Medium High (12 ppm)	
AMMONIUM NITROGEN	Low (12 ppm)	Low (12 ppm)	Low (12 ppm)	
PHOSPHORUS	Medium (25 ppm)	High (75 ppm)	Medium Low (19 ppm)	
POTASSIUM	High (250 ppm)	Medium (120 ppm)	Low (60 ppm)	
CALCIUM	Medium High (1200 ppm)	High (1400 ppm)	Medium High (1200 ppm)	
MAGNESIUM	High (125 ppm)	High (125 ppm)	High (125 ppm)	

SUGGESTED TREATMENTS (pounds per 1000 square feet)				
pH ADJUSTMENT	Limestone 90 lbs.	Limestone 50 lbs.	Limestone 50 lbs.	
FERTILIZER GRADE	Cottonseed meal 20 lbs	Cottonseed meal 30 lbs	Cottonseed meal 30 lbs	
FERTILIZER AMOUNT	Bonemeal,20 lbs	Greensand,20 lbs	Bonemeal,20 lbs Greensand,20 lbs	

**Remarks:**

ppm (parts per million) values are approximate.

Working 1-3 inches of compost or other organic materials into the soil each year improves gardens.

## EXPLANATION OF RESULTS

Soil tests serve as a guide to intelligent and environmentally sensitive use of fertilizers and other soil amendments. Information from soil tests cannot correct plant problems caused by insects or disease or site limitations such as not enough sunlight.

**SOIL TEXTURE:** Texture describes the amount of sand, silt and clay in the soil. It influences the amount of water and nutrients a soil can hold. *Sands, loamy sands* and *sandy loams* require more frequent watering and lose nutrients more readily by leaching than do *fine sandy loams* and *loams*. *Silt loams, silty clay loams* and *clay loams* often retain excessive moisture and reduce air movement to plant roots.

**ORGANIC MATTER:** Organic matter also influences the amount of water and nutrients held by the soil. *High* organic soils have better structure and retain nutrients and water better than *Medium* organic soils. *Low* organic soils may be improved by the addition of organic materials such as compost. A yearly addition of organic matter to gardens promotes soil improvement.

**pH:** Soil pH affects the availability of nutrients and, when interpreted with texture and organic matter, indicates the limestone needs of the soil. The results are expressed in pH units, with pH 7.0 being neutral. Connecticut soils are generally somewhat acidic in the pH range of 4.5 to 6.5. Most plants except for rhododendrons, azaleas, mountain laurel and blueberries grow best at a soil pH between 6.0 and 7.0.

### NUTRIENT TESTS

The Morgan Test provides an estimate of nutrient availability to plants. Results are given in relative terms such as *Low*, *Medium*, and *High*. *Excessive* is used when nutrient concentrations may damage plants. Generally, plant nutrients should be high during periods of rapid plant growth.

**NITRATE NITROGEN:** Plants generally take up nitrogen in the form of nitrate (NO<sub>3</sub>-N), either from applied fertilizers or microbial conversion of other forms of organic nitrogen in the soil. The Morgan Test indicates how much nitrogen is immediately available to plants, but not the ability of the soil to provide nitrogen throughout the growing season. Excess nitrate nitrogen can be harmful to plants and may leach to ground water.

**AMMONIUM NITROGEN:** Soils generally do not contain high concentrations of ammonium unless they have been recently fertilized, over fertilized or received manure. High ammonium levels are sometimes harmful to plants.

**PHOSPHORUS:** Optimal levels of phosphorus favor strong seedlings, abundant fruit and colorful flowers. Phosphorus can be over applied.

**POTASSIUM:** Plant hardiness is improved with proper amounts potassium. Over application of potassium can result in excessive soil salinity.

**CALCIUM:** Calcium levels in conjunction with the pH test, will determine the need for limestone or gypsum.

**MAGNESIUM:** This test identifies soils where magnesium treatments such as dolomitic limestone or Epsom salts may be beneficial.

**SALTS:** Measurements of soluble salts are sometimes reported on our tests where over-fertilization or other sources of salt may have injured plants.

### CORRECTING DEFICIENCIES OR EXCESSES

The soil test suggests additions of fertilizers and other amendments based on site and crop specific needs.

**pH ADJUSTMENT:** Limestone suggestions are based on the use of dolomitic limestone. Rates of pelletized limestone are the same as pulverized limestone. Hydrated lime may be used if the rate is reduced to three-fourths of that for limestone. Aluminum sulfate or sulfur is suggested when soil acidification is needed.

**FERTILIZER:** The principal plant nutrients in mixed fertilizers are nitrogen (N), phosphorus (P) and potassium (K). Although they may be present in various forms, the formula is always expressed as percent of N, P (as P<sub>2</sub>O<sub>5</sub>) and K (as K<sub>2</sub>O) in that order. Thus a 5-10-5 fertilizer would contain 5 lbs. of N, 10 lbs. of P<sub>2</sub>O<sub>5</sub> and 5 lbs. of K<sub>2</sub>O per 100 lbs. Fertilizers other than those suggested on the report may be used if the amounts of nutrients applied are similar.

Organic fertilizers are usually slower acting and lower in nutrients. They are often recycled waste products. Multiple materials such as cottonseed meal and bone meal are often needed. Recently, commercially prepared organic fertilizers containing various ratios of N, P and K have become available. These fertilizers can be substituted if the amount of nutrients applied is similar. Fresh manure may damage some plants and should be worked into the soil well in advance of planting.

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